REMARKS/ARGUMENTS

Claims 25-30, 34-39, 44, and 45 remain pending. Favorable reconsideration is respectfully requested.

The rejection of Claims 25-27, 29-30, and 34-36 under 35 U.S.C. §102(e) over Vandiest (U.S. patent No. 5,721,054) is respectfully traversed.

An important feature of the claimed substrate is that it has a coating comprising at least partially crystalline titanium oxide and where the coating has photocatalytic properties or hydrophilic and/or photocatalytic properties.

Applicants submit herewith the executed Rule 132 Declaration of Dr. Léthicia Guéneau, who has eight years of experience in the field of physico chemistry/self-cleaning glass (see paragraphs 1 and 2 of the Declaration).

According to Dr. Guéneau, Vandiest describes a glazing panel produced by pyrolytic coating of a substrate (see the Abstract). The coating contains an absorbent layer comprising at least one oxide selected from chromium, cobalt, and iron. The coating also contains a non-absorbent layer which comprises a material having a refractive index within the range of 1.4 to 3.0 (see the Abstract). The purpose of the coating is to have low solar factor and a high purity of reflected color (see column 2, lines 13-17). Vandiest fails to describe that the coating described therein is photocatalytic or hydrophilic. See paragraph 5 of the Declaration. In Example 2, Vandiest describes a glass substrate coated with a 41 nm TiO_2 layer, which, in turn, is coated with a layer of Fe, Co, and Cr oxides having a thickness of 45 nm.

Dr. Guéneau points out that in Example 2, Vandiest describes a glass substrate coated with a 41 nm TiO_2 layer, which, in turn, is coated with a layer of Fe, Co, and Cr oxides

having a thickness of 45 nm (see paragraph (6) of the Declaration). In Example 3, Vandiest describes a glass substrate coated with a 85 nm TiO2 layer, which, in turn, is coated with a layer of Fe, Co, and Cr oxides having a thickness of 46.5 nm (see paragraph (7) of the Declaration). According to Dr. Guéneau, Fe, Co, and Cr oxides are well-known to be poisons for photocatalysts. Therefore, one of ordinary skill in the art would limit the contents of those metal oxides because of their known properties as photocatalyst poisons (see paragraph (8) of the Declaration).

Based on the foregoing, Vandiest fails to describe the claimed coated substrate. Withdrawal of this ground of rejection is respectfully requested.

The rejection of Claims 25-27, 29-30, and 34-35, 39, and 44-45 under 35 U.S.C. §102(e) over Teowee (U.S. patent No. 5,604,626) is respectfully traversed.

An important feature of the claimed substrate is that it has a coating comprising at least partially crystalline titanium oxide and where the coating has photocatalytic properties or hydrophilic and/or photocatalytic properties.

According to Dr. Guéneau, Teowee describes a photochromic device which allows a user to leave the device in a high transmissive state even when exposed to a source of radiation (see the Abstract). The device contains a radiation sensitive electrode 30 (see columns 7 and 8). Teowee fails to describe that the coating described therein is photocatalytic or hydrophilic. See paragraph (10) of the Declaration.

In addition, Dr. Guéneau points out that the absence of a binder, especially in Example 1, leads to coatings with very low mechanical strength (see paragraph (11) of the Declaration). Moreover, the operation involves heating to 450°C or 350°C, and, in the

absence of a barrier layer, does not result in effective photocatalyst (see paragraph (11) of the Declaration).

In view of the foregoing, Teowee fails to describe the claimed coated substrate. Withdrawal of this ground of rejection is respectfully requested.

The rejection of Claims 25-30 under 35 U.S.C. §103(a) over Kato (U.S. patent No. 6,284,314) is respectfully traversed.

According to Dr. Guéneau, the thickness of the coatings described by Kato are much greater than 50 nm. In the Examples of that reference, the coating thickness is 400 nm (Example 1), 500 nm (Example 2), 300 nm (Example 3), 400 nm (Example 4), 600 nm (Example 5), 400 nm (Example 6), 800 nm (Example 7), 600 nm (Example 8), 0.5 μm (Example 9), 0.4 μm (Example 10), 0.3 μm (Example 11), 0.5 μm (Example 12), 0.4 μm (Example 13), and 0.8 μm (Example 14). Thus, the thinnest coating described in the reference is 300 nm. See paragraph (13) of the Declaration.

Dr. Guéneau points out that in describing the procedure for preparing the coating, Kato states:

> it is desirable to produce a multilayer film by repeating a procedure which comprises depositing thinly and uniformly the ceramic sol...on a substrate...thereby forming a thin film of the solution on the substrate.... As a result, a sturdy porous ceramic thin film excellent in durability can be obtained. [Column 3, lines 33-42.] See paragraph (14) of the Declaration.

In addition, Dr. Guéneau notes that Kato is completely silent regarding the size of titanium oxide crystallites (see paragraph (15) of the Declaration). According to Dr. Guéneau, the reference also fails to describe the contact angle or the root mean square (RMS) rugosity of

the coating (see paragraph (16) of the Declaration). Dr. Guéneau also points out that Kato fails to explicitly disclose a layer which functions as a barrier to alkali metals originating from the substrate, and that the reference does not suggest that such a component would be desirable. See paragraph (19) of the Declaration.

According to Dr. Guéneau, there is no suggestion in Kato to produce a coating having a thickness which is 5 to 80 nm. Kato specifically directs one to prepare a coating using a multiple dipping technique, which would not suggest a coating that was only approximately 1/4 the thickness of the thinnest coating described in the reference. In Dr. Guéneau's opinion, Kato certainly fails to suggest a coating which is 5 to 50 nm, which is only 1/6 as thick as the thinnest coating described in that reference. See paragraph (17) of the Declaration.

According to Dr. Guéneau, Kato also fails to suggest that the titanium crystallites have an average size of between 60 and 100 nm, since the reference fails to even mention titanium crystallites at all. See paragraph (18) of the Declaration.

In Dr. Guéneau's opinion, Kato is completely silent with respect to the RMS rugosity of the coating and, therefore, fails to suggest a coating having a value between 2 and 20 nm. See paragraph (21) of the Declaration.

In addition, Dr. Guéneau points out that Kato describes the optional heating of solutions coated on substrates in the absence of a barrier layer to alkalis, such as sodium from the substrate. Quartz glass substrates are described, which consist of SiO_2, and do not contain alkalis. See paragraph (22) of the Declaration.

Claim 25 specifies, *inter alia*, that the coating has a thickness between 5 and 50 nm and the crystallized titanium oxide is in the form of crystallites with an average size of

between 60 and 100 nm. The thinnest film described in the reference is 300 nm. There is no suggestion in Kato to produce a coating having a thickness which is 5 to 50 nm as claimed. Kato specifically directs one to prepare a coating using a multiple dipping technique, which would not suggest a coating that was only 1/6 the thickness of the thinnest coating described in the reference. Moreover, Kato fails to suggest that the titanium crystallites have an average size of between 60 and 100 nm, since the reference fails to even mention titanium crystallites at all. Accordingly, Kato fails to suggest the coated substrate recited in Claim 25.

Claim 26 recites, *inter alia*, (1) a thin layer a thin layer forming a barrier to alkali metals originating from the substrate, which is located between the substrate and the coating, and (2) that the crystallized titanium oxide is in the form of crystallites with an average size of between 60 and 100 nm. Kato does not identify a layer which functions as a barrier to alkali metals originating from the substrate, nor does the reference suggest that such a component would be desirable. Kato fails to suggest that the titanium crystallites have an average size of between 60 and 100 nm, since the reference fails to even mention titanium crystallites at all. Accordingly, Kato fails to suggest the coated substrate recited in Claim 26.

Claim 27 specifies, *inter alia*, (1) that the coating has contact angle with water below 5° after exposure to luminous rays and (2) that the crystallized titanium oxide is in the form of crystallites with an average size of between 60 and 100 nm. Kato is completely silent with respect to the contact angle of the coating and, therefore, fails to suggest a coating having a value below 5° as claimed. In addition, Kato fails to suggest that the titanium crystallites have an average size of between 60 and 100 nm, since the reference fails to even mention

titanium crystallites at all. Accordingly, Kato fails to suggest the coated substrate recited in Claim 27.

Claim 28 *inter alia*, (1) that the coating has an RMS rugosity between 2 and 20 nm and (2) that the crystallized titanium oxide is in the form of crystallites with an average size of between 60 and 100 nm. Kato is completely silent with respect to the RMS rugosity of the coating and, therefore, fails to suggest a coating having a value between 2 and 20 nm. In addition, Kato fails to suggest that the titanium crystallites have an average size of between 60 and 100 nm, since the reference fails to even mention titanium crystallites at all. Accordingly, Kato fails to suggest the coated substrate recited in Claim 28.

Claim 29 specifies, *inter alia*, that the coating has a thickness between 10 and 80 nm and the crystallized titanium oxide is in the form of crystallites with an average size of between 60 and 100 nm. The thinnest film described in the reference is 300 nm. There is no suggestion in Kato to produce a coating having a thickness which is 5 to 50 nm as claimed. Kato specifically directs one to prepare a coating using a multiple dipping technique, which would not suggest a coating that was only about 1/4 the thickness of the thinnest coating described in the reference. Accordingly, Kato fails to suggest the coated substrate recited in Claim 29.

Claim 30 specifies, *inter alia*, that the coating has a thickness between 20 and 50 nm and the crystallized titanium oxide is in the form of crystallites with an average size of between 60 and 100 nm. The thinnest film described in the reference is 300 nm. There is no suggestion in Kato to produce a coating having a thickness which is 5 to 50 nm as claimed. Kato specifically directs one to prepare a coating using a multiple dipping technique, which

would not suggest a coating that was only 1/6 the thickness of the thinnest coating described in the reference. Accordingly, Kato fails to suggest the coated substrate recited in Claim 30.

The rejection of Claim 39 under 35 U.S.C. §103(a) over Vandiest is respectfully traversed.

Claim 39 recites a windshield wherein at least the face of said windshield turned toward the inside of the passenger compartment is provided with a coating having hydrophilic and/or photocatalytic properties and comprising titanium oxide at least partly crystallized in the anatase form.

As noted by Dr. Guéneau above, the purpose of the coating described in Vandiest is to have low solar factor and a high purity of reflected color (see column 2, lines 13-17 of the reference). Vandiest fails to describe that the coating described therein is photocatalytic or hydrophilic. In addition, as recognized by the Examiner, the glazing described by Vandiest is to be used for architectural buildings and not as a windshield. See paragraph (23) of the Declaration. In view of these differences, the reference fails to suggest the claimed windshield. Accordingly, withdrawal of these grounds of rejection is respectfully requested.

Applicants submit that the application is in condition for allowance. Early notice to this effect is earnestly solicited.

Respectfully submitted,

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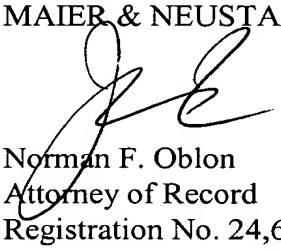

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